

Jan. 24 Transit to Pease

Summary:

Other than skipping the sun run due to an FTS failure, the flight went as planned. We crossed the edge of the vortex, and flew in the tropopause region most of the flight. There was a great deal of variability in flight-level tracers (O_3 , CO, HNO_3 , etc.) in the upper troposphere/lower stratosphere region over Canada.

Plan:

Fly northeast as quickly as possible to the edge of the vortex at the northeast corner of Hudson Bay. Then turn southeast and do a sun run for about an hour, then head into Pease. No satellite coordination.

Report:

Takeoff was spot on time (0630 local). FTS had a data-system failure early in the flight. After ascending to 37 Kft, we appeared to be cruising near the tropopause ($O_3=118$ ppbv, $H_2O=25$ ppmv).

Shortly after crossing the Canadian border, we encountered thin cirrus and mild turbulence at 37 Kft.

Since the FTIR failure could not be diagnosed in-flight, we decided to skip the vortex sun run. The decision was to still fly to the northernmost waypoint then head directly south into Pease.

When we ascended to 38 Kft, we were still in ice supersaturated air at ozone concentrations of 65-70 ppbv.

Once we got over Hudson Bay, we had clear column conditions. The ozone concentration got as high as 600 ppbv and water vapor concentration stayed above about 8. Through much of the northern part of the flight, there was a great deal of structure in in situ ozone that was inversely correlated with CO. DIAL reported detection of the vortex edge at about waypoint 8 (63°N, 86°W).

Considerable arctic haze (non-depolarizing) was present at 0-4 km above northern Hudson Bay. Minimum MTP temperature was about 210 K at 26 km. Minimum ozone concentration in the vortex was about 2.5 ppmv at about 17-20 km (see figure below).

Instrument status:

- AROTAL good flight, prefer lower sun
- DIAL no problems
- FTIR failure in data system, no data
- CAFS good flight
- MTP good flight
- AZUR cable problem early in flight, good data thereafter
- nadir CO_2 good flight
- FastOz good flight
- DACOM CO problems 1st hour, CH_4 , NO_2 problems, repairs needed
- DLH good flight
- Mist chamber worked well
- TD-LIF good flight
- ICATS worked fine
- COBALT good flight

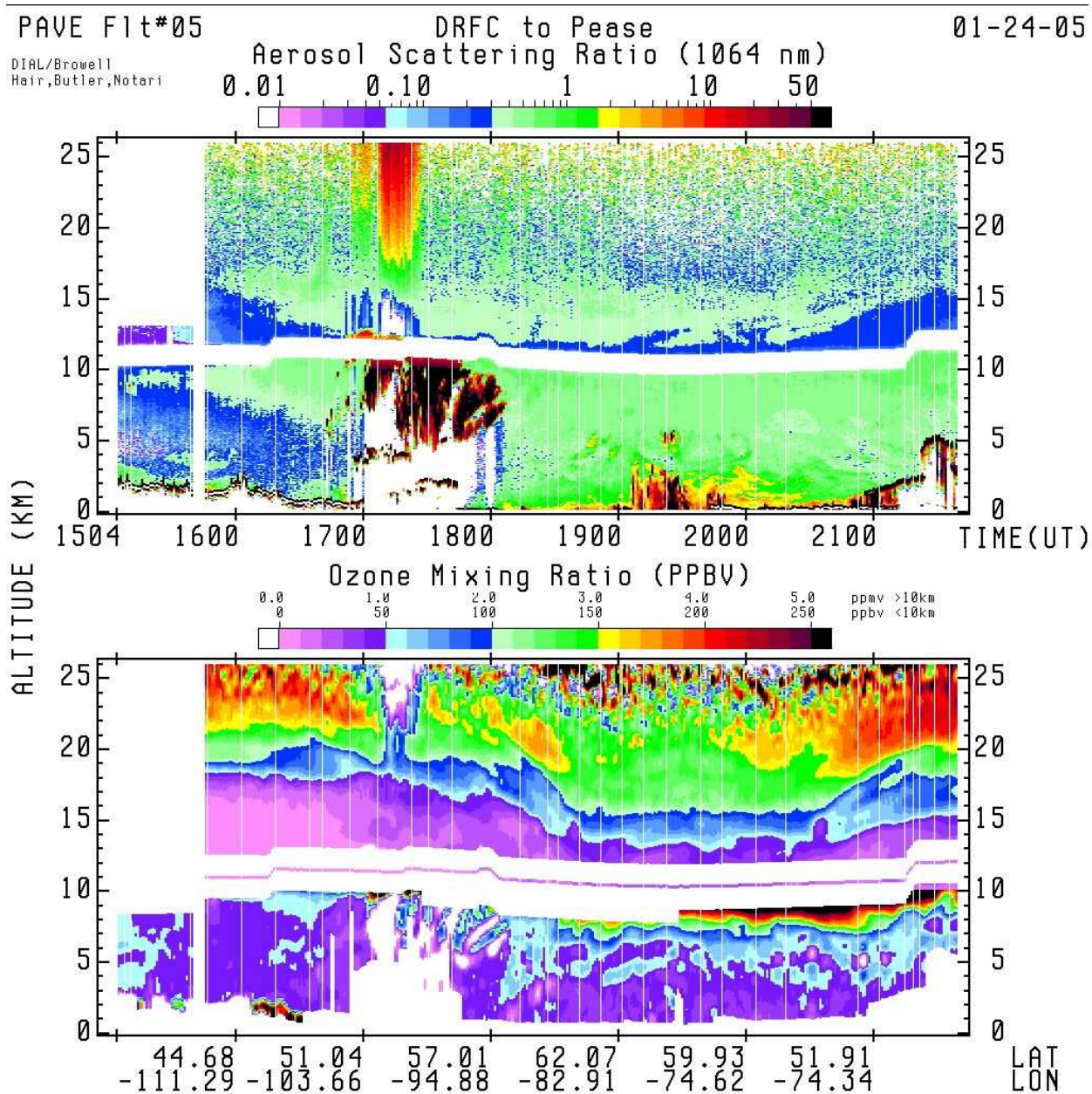


Figure 1: DIAL quicklook data.